PATENT SPECIFICATION

377,454

Application Date: Aug. 15, 1931. No. 23,024 / 31.

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Complete Accepted: July 28, 1932.

PROVISIONAL SPECIFICATION.

Improvements in or relating to Coupling Shafts.

We, DUNLOP RUBBER COMPANY LIMITED, a British Company, of 32, Osnaburgh Street, London, N.W. 1, and SETH SADLER, a British Subject, of the aforesaid Company's Works at Fort Dunlop, Erdington, Birmingham, in the County of Warwick, do hereby declare the nature of this invention to be as follows:—

This invention concerns couplings for shafts.

One of the objects of the invention is to provide a method of assembly whereby a non-rigid coupling is obtained which also permits of some degree of misalignment or non-parallelism without deterioration of the resilient medium employed for these purposes.

Another object of the invention is the provision of a coupling in which one of the rigid parts forming the coupling through which the power is transmitted may be supported entirely by the elastic medium, a separate bearing adjacent the coupling being rendered unnecessary.

Another object of the invention is the maintenance of a static stress, which is sufficient to maintain a firm contact of the yielding material with the rigid parts before and when under load, and permits of the accommodation of considerable relative angular movements between the yielding material and the metal housings without setting up relative movement between the rubber itself and the metal surrounding it.

According to this invention we provide a method and mechanism for connecting a driving shaft to a driven shaft in which collars are secured to the ends of the shafts the collars having rigid intermeshing arms with interposed yielding material which is adjustably compressed or stressed during assembly, preferably by radial movement of the material relative to the arms and independently thereof, the material being stressed or compressed beneath surfaces or plates movable towards or away from each arm, the material compressed preferably consisting of rubber blocks the sides of which may be in planes radial to the shaft axes and which may be faced with suitable material or may be secured to metal plates to diminish the friction when the blocks slide radially in and out upon the faces recessed in opposite arms, one of the recessed faces being formed in an arm extending from a collar secured to one of the shafts and the other recessed face being formed in an arm extending from a collar which may be keyed or splined to the other shaft.

In one embodiment of this invention each shaft has secured to it a collar member the bore of which is formed with a plurality of grooves and splines. The outer circumferential surface of the collar is formed integrally with axially rising and extending webs or buttresses of triangular formation which support axially extending wedge-shaped arms at a relatively greater radius, each arm having recessed faces in radial planes.

Each shaft is provided with a similar collar and with similar arms which extend from the collar on one shaft and intermesh alternately with an arm extending from the collar secured to the other shaft.

Between the opposite and recessed faces of these arms are positioned wedge shaped rubber blocks the outer and inner circumferential faces of which may be of concave flat or other formation the radial faces through which the drive is transmitted being faced or reinforced with vulcanite, canvas or other fabric, or the blocks may be bonded to metallic channel-shaped plates sliding radially on each side in the recess in the arms the radial movement of the rubber blocks and the degree of compression being adjusted and controlled by the radial movement of the circumferentially disposed pressure plates which are radially movable towards and away from the outer circumferential surfaces of the arms by means of bolts, a pair of which pass radially through each plate into threaded engagement with each of the arms, the inner surface of each of these plates engaging at right angles the outer edges of the blocks or of the metal plates or other surfaces bonded to the rubber blocks and forcing these inwards and towards the shaft to the required degree when the bolts are rotated. The bolts may then be locked by split pins when the

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stress imposed on the material is sufficiently great.

Dated this 14th day of August, 1931.

W. BOND,
Acting for the Applicants.

COMPLETE SPECIFICATION.

Improvements in or relating to Coupling Shafts.

We, DUNLOP RUBBER COMPANY LIMITED, a British Company, of 32, Osnaburgh Street, London, N.W.1, and SETH SADLER, a British Subject, of the aforesaid Company's Works at Fort Dunlop, Erdington, Birmingham, in the County of Warwick, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention concerns couplings for shafts.

One of the objects of the invention is to provide a method of assembly whereby a non-rigid coupling is obtained which also permits of some degree of misalignment or non-parallelism without deterioration of the resilient medium employed for these purposes.

Another object of the invention is for provision of a coupling in which one of the rigid parts forming the coupling through which the power is transmitted may be supported entirely by the elastic medium, a separate bearing adjacent the coupling being rendered unnecessary.

Another object of the invention is the maintenance of a static stress, which is sufficient to maintain a firm contact of the yielding material with the rigid parts before and when under load, and permits of the accommodation of considerable relative angular movements between the yielding material and the metal housings without setting up relative movement between the rubber itself and the metal surrounding it.

According to this invention we provide a flexible shaft coupling having collars with rigid intermeshing arms positioning interposed yielding material of wedge formation adjustably compressed by radially movable plates which bear upon the outer edges of the yielding wedges, the yielding wedges being preferably inserted between opposed faces recessed into the supporting arms.

In order that the invention may be easily understood and more readily carried into effect, the invention will now be described with reference to the accompanying drawings, in which:—

Fig. 1 is a part perspective view of the coupling.

Fig. 2 is a side elevation of the coupling.

Each shaft 1, has secured to it a collar member 2, the bore of which is formed with a plurality of grooves 3 and splines 4. The outer circumferential surface of the collar is formed integrally with radially rising and extending webs or buttresses 5 of triangular formation which rigidly support radially extending wedge-shaped arms 6 at a relatively greater radius, each arm having recessed faces 7 in radial planes.

Each shaft is provided with a similar collar and with similar arms which extend from the collar on one shaft and intermesh alternately with an arm extending from the collar secured to the other shaft.

Between the opposite and recessed faces of these arms are positioned wedge-shaped rubber blocks 8, the outer and inner circumferential faces 9 of which may be of concave formation, as shown or may be flat, the radial faces through which the drive is transmitted being faced or reinforced, with vulcanite, canvas or other fabric, or the wedges may be bonded to metallic channel-shaped plates 10, sliding radially on each side in the recess in the arms, the radial movement of the rubber wedges and the degree of compression being adjusted and controlled by the radial movement of the circumferentially disposed pressure plates 11, which are radially movable towards and away from the outer circumferential surfaces of the arms by means of bolts 12, a pair of which pass radially through each plate into threaded engagement with each of the arms, the inner surface of each of these plates engaging at right angles the outer edges of the wedges or of the metal plates or other surfaces bonded to the rubber wedges, and forcing these inwards and towards the shaft to the required degree when the bolts are rotated. The bolts may then be locked by split pins 13 when the stress imposed on the yielding material is sufficiently great.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. A flexible shaft coupling having

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collars with rigid intermeshing arms positioning interposed yielding material of wedge formation adjustably compressed by radially movable plates which bear upon the outer edges of the yielding wedges.

2. A flexible coupling according to the preceding claim in which the yielding wedges are inserted between opposed faces recessed into the supporting arms.

3. A flexible coupling according to any of the preceding claims in which the surfaces of the yielding wedges engaging the opposed recessed faces are bonded to metal plates.

4. A flexible coupling according to any of the preceding claims in which the means for adjusting the static pressure consist of bolts having screw threaded engagement with the peripheral surfaces of the arms between which the yielding wedges are positioned.

5. A flexible coupling according to any of the preceding claims in which the arms between which the yielding wedges are positioned comprise pairs of radial surfaces, each pair of surfaces being supported by triangular webs rising from the collar attached to the shaft.

6. Flexible couplings for shafts having their parts constructed and arranged to operate substantially as described with reference to the accompanying drawings.

Dated the 4th day of May, 1932.

W. BOND,
Acting for the Applicants.

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[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

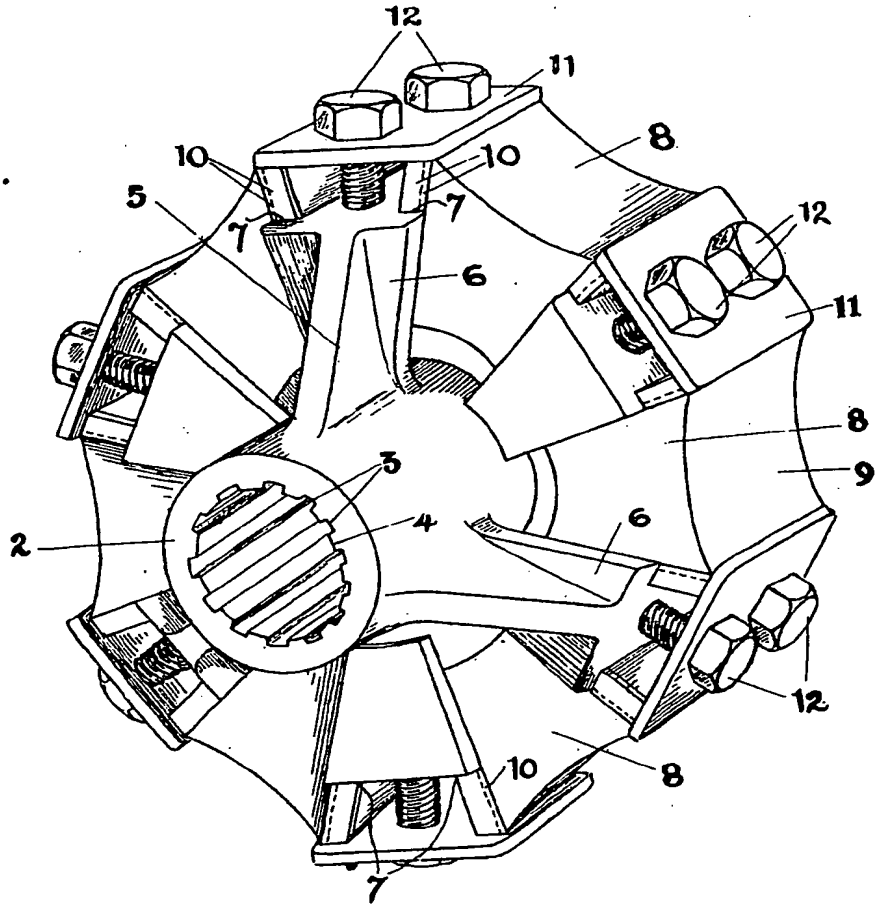
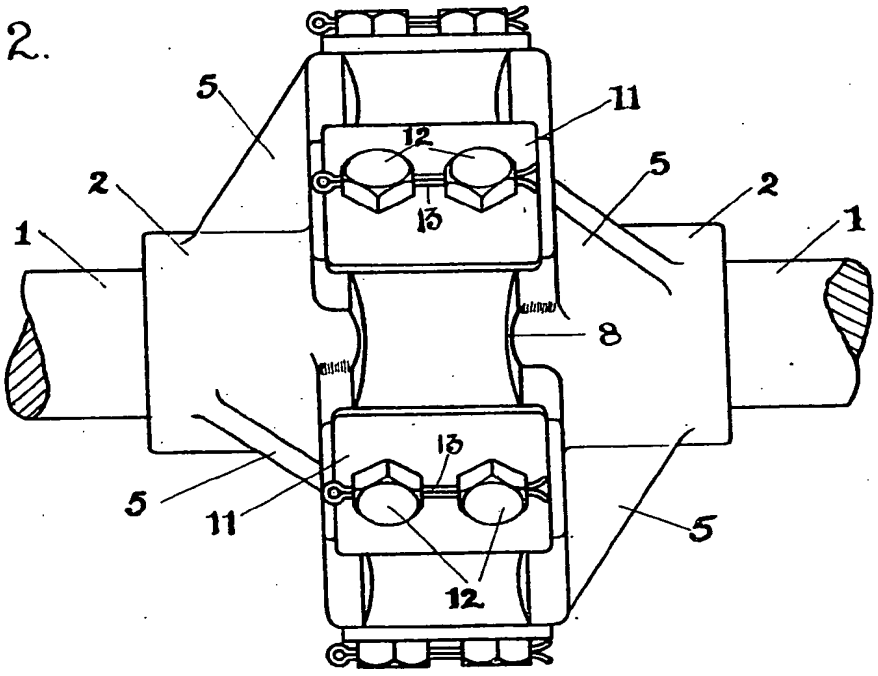


Fig. 2.



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